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(19)

(54) LAMINATES

(71) We, IMPERIAL CHEMICAL INDUSTRIES LIMITED, Imperial Chemical House, Millbank, London SW1P 3JF, a British Company do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:–

The present invention relates to laminates.

According to the present invention a flexible laminate is provided which comprises a first outer layer which is a continuous thermoplastic material, a first backing layer for the first outer layer, a second outer layer which is a tack-spun (as hereinafter defined) pile-surfaced product on a second backing layer, the first and second backing layers adhering together.

A tack-spun pile-surfaced product is formed by feeding a polymeric material between a backing and a temporary anchorage surface (the polymeric material being in a state such that it is tacky and capable of adhering to the backing and also of adhering temporarily to the temporary anchorage surface) separating the backing and the temporary anchorage surface so that drawing of the polymeric material occurs with the production of fibres or tufts of fibres of the polymeric material, hardening the polymeric material by cooling (if it is thermoplastic and had been rendered tacky by heat) or by completion of a cross-linking reaction (when the polymer is a curable polymer and undergoes cure during or after bore formation) and separation of the fibres or tufts of holes from the temporary anchorage surface, and the term "tack-spun" should be understood accordingly.

The first outer layer is made from any flexible thermoplastic material that can be fabricated into a thin continuous sheet. Such materials include addition polymers for example polymers and copolymers of ethylene, propylene, butadiene, vinyl chloride, vinyl acetate, vinylidene chloride, acrylonitrile and styrene and condensation polymers such as polyamides and polyesters; preferred such materials are thermoplastic polyurethanes and plasticised polymers containing vinyl chloride; particularly preferred is plasticised poly (vinyl chloride) having British Standard softness 40 to 90 (British Standard 2782:1970). The first outer layer may be embossed if desired so as to produce for example a simulated leather, and it may have other outer surface finishes such as a lacquer or wear layer or be metallised; the inner surface may if desired be foamed so as to provide insulation and resilience to the layer or metallised to provide insulation.

The second outer layer comprises a plurality of fibres or tufts of fibres of polymeric material. The pile is generally formed on a backing layer such as, for example paper, cardboard or woven or non-woven textile material. Processes by which pile-surfaced products may be produced are described in British patent specifications 1334672, 1378638, 1378639, 1378640, 1384707, 1399095, 1451311, 1451312, 1451313, 1472405, and British patent applications 1492943 and 1499661. In a preferred embodiment of the present invention, the pile is fabricated from low density polyethylene, most preferably pigmented. The pile may be embossed by for example the process described in British patent 1399821.

The laminate of the present invention comprises two backing layers which may be the same or different. The backing layers may be made from any material which is capable of adhering to each other by, for example using an adhesive. In general the backing layers can be made from any flexible material such as paper, thin cardboard, woven and non-woven cloth.

The laminates of the present invention may be made for example by forming the first outer layer on its backing, and the second outer layer on its backing and joining the two backings using, for example an adhesive. The choice of adhesive will depend on for example the backings and the equipment used for applying the adhesive but generally contact adhesives, synthetic rubber adhesives and adhesives based on synthetic resin (e.g. polyvinyl acetate) dispersions, preferably plasticiser free, are generally satisfactory. In one preferred embodiment the backing for the first outer layer is woven or non-woven or knitted cloth or crepe paper and the backing for the second outer is non-woven material, the two backings adhering together using a contact adhesive to form the present laminate.

The laminates of the present invention are useful where the two outer surfaces are required to perform different functions, for example wear, feel, decoration. The laminates are particularly useful as shoe uppers, in which the first outer layer is flexible polyurethane or poly(vinyl chloride) and provides the outside of, for example a shoe with a simulated leather finish, and the second outer layer is a pile-surfaced product made from, for example, polyethylene, and provides the inside of the shoe with a simulated suede leather finish which is attractive and comfortable to the wearer; such laminates are also useful in the preparation of travel goods such as suitcases and handbags and spectacle cases and other types of synthetic Morocco leather articles. The products are also useful in heat insulation applications, for example pipe or refrigerator cladding, in which the first outer layer may be metallised polyester film preferably with the metal surface outside of the first outer layer.

The invention is illustrated with reference to the accompanying drawing which is a cross-section of a piece of laminate according to the invention.

The laminate has a first outer layer 1 which is plasticised poly(vinyl chloride) having British Standard softness 50 (British Standard 2783:1970) on which is provided a surface emboss 2. The first outer layer is backed with woven cotton fabric 3. The first outer layer and its backing are made by a method conventional in the fabric coating art in which a paste of poly(vinyl chloride) in plasticiser was spread out onto the woven cotton fabric and gelled and embossed. Second outer layer 4 is pigmented pile-surfaced product made from low-density polyethylene on a non-woven viscose rayon fabric backing 5 having density 50 g/m^2. This second outer layer was produced by bringing together a film of low density polyethylene and the non-woven viscose rayon backing material and pressing the film against a heated roll whereby fibrils are drawn from the surface of the film as the film is separated from the roll while cooling the polyethylene to below its softening point, and the polyethylene bonds to the non-woven material.

The first outer layer and its backing, and the second outer layer and its backing were laminated backing to backing using a solvent free polyvinyl acetate emulsion having viscosity 3300 centipose, density 1.10 g/cm^3 and solids content of 62% by weight.

The laminate so formed had an attractive appearance and was shaped for use as a shoe upper. The resulting shoe was attractive in appearance, comfortable both in conforming to foot shape and in allowing the foot to breath.

WHAT WE CLAIM IS:–

1. A flexible laminate which comprises a first outer layer which is a continuous thermosplastic material, a first backing layer for the first outer layer, a second outer layer which is a tack-spun (as hereinbefore defined) pile-surfaced product on a second backing layer, the first and second backing layers adhering together.

2. A flexible laminate according to claim 1 in which the backing layers are adhered together using an adhesive.

3. A flexible laminate according to claim 2 in which the adhesive is a contact adhesive.

4. A flexible laminate according to claim 2 in which the adhesive is a solvent free polyvinyl acetate emulsion.

5. A flexible laminate according to any one of claims 1 to 4 in which the backing layers are both textile materials which may be the same or different.

6. A flexible laminate according to any one of claims 1 to 5 in which the first outer layer is plasticised polyvinyl chloride.

7. A flexible laminate according to any one of claims 1 to 6 in which the pile-surfaced product is formed from polyethylene.

8. A flexible laminate according to any one of claims 1 to 7 in which one outer surface is embossed.

9. A flexible laminate according to claim 8 in which the first outer surface has a simulated leather emboss.

10. A flexible laminate according to claim 1 substantially as hereinbefore described with reference to the drawing.

11. A shoe upper whenever made from a flexible laminate as claimed in anyone of claims 1 to 10.

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1 SHEET

COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale